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Ephemeris for Physical Observations of

(Continued from

Greenwich Noon. 1898.	P.	L−O.	B.	A−L.	*B*.	Q.	E.
	°	°	°	°	°	°	°
Nov. 12	353·66	217·42	+15·90	−34·88	+ 1·19	283·39	37·43
14	354·05	218·04	16·05	34·61	1·61	283·51	37·02
16	354·41	218·60	16·17	34·28	2·03	283·62	36·58
18	354·76	219·12	16·27	33·91	2·45	283·71	36·10
20	355·08	219·60	16·35	33·50	2·87	283·77	35·58
22	355·36	220·04	+16·42	−33·06	+ 3·28	283·81	35·03
24	355·62	220·44	16·47	32·58	3·69	283·84	34·43
26	355·86	220·81	16·50	32·07	4·10	283·84	33·81
28	356·07	221·14	16·53	31·52	4·50	283·81	33·14
30	356·25	221·42	16·54	30·93	4·90	283·76	32·42
Dec. 2	356·40	221·66	+16·53	−30·29	+ 5·30	283·68	31·69
4	356·53	221·86	16·50	29·62	5·70	283·55	30·90
6	356·62	222·00	16·46	28·88	6·10	283·39	30·07
8	356·68	222·09	16·40	28·10	6·50	283·19	29·19
10	356·70	222·14	16·31	27·28	6·89	282·95	28·26
12	356·69	222·12	+16·20	−26·39	+ 7·28	282·68	27·28
14	356·64	222·05	16·08	25·45	7·67	282·35	26·26
16	356·56	221·92	15·94	24·45	8·05	281·99	25·17
18	356·44	221·75	15·78	23·41	8·43	281·56	24·03
20	356·28	221·52	15·61	22·32	8·81	281·06	22·84
22	356·09	221·23	+15·42	−21·16	+ 9·18	280·47	21·59
24	355·87	220·89	15·22	19·95	9·55	279·78	20·29
26	355·62	220·50	15·00	18·70	9·92	278·99	18·95
28	355·32	220·05	14·76	17·39	10·29	278·12	17·55
30	354·98	219·55	14·51	16·02	10·65	277·04	16·12
1899.							
Jan. 1	354·62	219·02	+14·25	−14·63	+11·01	275·74	14·63
3	354·23	218·44	13·97	13·18	11·37	274·14	13·12
5	353·81	217·82	13·68	11·72	11·72	272·28	11·57
7	353·37	217·17	13·39	10·18	12·07	269·77	10·01
9	352·92	216·50	13·09	8·64	12·41	266·45	8·43
11	352·45	215·80	+12·77	− 7·07	+12·75	261·70	6·87
13	351·94	215·07	12·45	5·47	13·09	254·29	5·34
15	351·44	214·32	12·13	3·85	13·43	241·71	3·95
17	350·94	213·57	+11·80	− 2·23	+13·76	218·40	2·91

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Mars, 1898–99. By A. C. D. Crommelin.

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Greenwich Noon.		Light Time.	Appar. Diam.	Defect of Illumination. q	Central Meridian. ω₀	Passage of Zero Meridian.	
1898.		m	″	″	°	h m	h m
							16 8
Nov.	12	8·10	9·85	1·01	115·00	16 46	
							17 25
	14	7·98	10·00	1·01	96·20	18 4	
							18 42
	16	7·86	10·16	1·00	77·45	19 20	
							19 58
	18	7·74	10·32	0·99	58·74	20 37	
							21 15
	20	7·62	10·49	0·98	40·08	21 54	
							22 32
	22	7·49	10·66	0·97	21·45	23 10	
							23 48
	24	7·37	10·83	0·95	2·87	...	
							0 26
	26	7·25	11·01	0·93	344·31	1 4	
							1 42
	28	7·13	11·19	0·91	325·79	2 20	
							2 58
	30	7·01	11·38	0·89	307·33	3 36	
							4 14
Dec.	2	6·90	11·57	0·86	288·90	4 52	
							5 30
	4	6·79	11·76	0·83	270·51	6 7	
							6 45
	6	6·68	11·95	0·80	252·18	7 23	
							8 1
	8	6·57	12·15	0·77	233·90	8 38	
							9 16
	10	6·47	12·34	0·73	215·66	9 53	
							10 30
	12	6·37	12·54	0·69	197·49	11 7	
							11 44
	14	6·27	12·73	0·65	179·37	12 21	
							12 58
	16	6·18	12·92	0·61	161·30	13 35	
							14 12
	18	6·09	13·11	0·57	143·28	14 49	
							15 26
	20	6·01	13·30	0·52	125·31	16 3	
							16 40
	22	5·93	13·48	0·47	107·40	17 16	
							17 53
	24	5·85	13·65	0·42	89·55	18 29	
							19 6
	26	5·78	13·81	0·37	71·74	19 42	
							20 19
	28	5·71	13·97	0·32	53·99	20 55	
							21 32
	30	5·65	14·12	0·27	36·29	22 8	
							22 44
1899. Jan.	1	5·60	14·26	0·23	18·61	23 20	
							23 56
	3	5·55	14·38	0·19	0·99	...	
							0 32
	5	5·51	14·49	0·15	343·40	1 8	
							1 44
	7	5·48	14·58	0·11	325·85	2 20	
							2 56
	9	5·45	14·65	0·08	308·31	3 32	
							4 8
	11	5·43	14·70	0·06	290·80	4 44	
							5 20
	13	5·42	14·74	0·04	273·31	5 56	
							6 32
	15	5·41	14·76	0·02	255·85	7 7	
							7 43
	17	5·41	14·75	0·01	238·38	8 18	

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Greenwich Noon.	P.	L−O.	B.	A−L.	*B.*	Q.	E.
1899.							
Jan. 19	350°·44	212°·81	+11°·48	− 0°·60	+14°·09	182°·43	2°·67
21	349·94	212·07	+11·18	+ 1·01	+14·41	152·54	3·39
23	349·44	211·33	10·88	2·62	14·73	135·80	4·65
25	348·94	210·61	10·59	4·21	15·05	126·53	6·09
27	348·47	209·91	10·32	5·79	15·37	120·73	7·61
29	348·01	209·23	10·05	7·35	15·68	116·85	9·13
31	347·58	208·58	+ 9·80	+ 8·88	+15·98	113·99	10·67
Feb. 2	347·17	207·97	9·58	10·37	16·28	111·74	12·16
4	346·79	207·40	9·38	11·82	16·58	109·97	13·62
6	346·44	206·86	9·19	13·24	16·87	108·55	15·04
8	346·11	206·36	9·03	14·63	17·16	107·39	16·42
10	345·81	205·92	+ 8·89	+15·95	+17·44	106·37	17·77
12	345·55	205·52	8·78	17·23	17·72	105·46	19·03
14	345·32	205·17	8·68	18·47	18·00	104·66	20·28
16	345·13	204·87	8·60	19·66	18·27	103·95	21·46
18	344·96	204·61	8·55	20·81	18·54	103·34	22·59
20	344·83	204·41	+ 8·53	+21·90	+18·80	102·84	23·65
22	344·73	204·25	8·55	22·96	19·06	102·43	24·69
24	344·67	204·13	8·58	23·98	19·31	102·07	25·66
26	344·63	204·06	8·61	24·95	19·56	101·75	26·58
28	344·63	204·04	8·66	25·87	19·81	101·47	27·45
Mar. 2	344·66	204·07	+ 8·73	+26·74	+20·05	101·24	28·23
4	344·72	204·14	8·82	27·57	20·29	101·04	29·00
6	344·79	204·25	8·93	28·36	20·52	100·89	29·73
8	344·90	204·40	9·06	29·12	20·74	100·77	30·41
10	345·04	204·60	9·22	29·83	20·96	100·68	31·06
12	345·20	204·83	+ 9·39	+30·51	+21·17	100·62	31·66
14	345·38	205·09	9·58	31·16	21·38	100·59	32·22
16	345·59	205·39	9·78	31·78	21·58	100·59	32·74
18	345·82	205·73	9·99	32·36	21·78	100·61	33·23
20	346·08	206·10	10·20	32·91	21·98	100·65	33·67
22	346·35	206·50	+10·43	+33·44	+22·17	100·71	34·08
24	346·64	206·93	10·67	33·93	22·35	100·80	34·46
26	346·95	207·39	10·93	34·39	22·53	100·90	34·81
28	347·29	207·88	11·20	34·82	22·70	101·02	35·14
30	347·64	208·41	11·47	35·22	22·87	101·15	35·43
Apr. 1	348·01	208·96	+11·75	+35·60	+23·03	101·30	35·70
3	348·40	209·53	+12·05	+35·96	+23·19	101·46	35·94

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Greenwich Noon.		Light Time.	Appar. Diam.	Defect of Illumination.	Central Meridian.	Passage of Zero Meridian.	
				q	ω_0		
1899.		m	″	″	°	h m	h m
							8 54
Jan.	19	5·42	14·72	0·01	220·92	9 29	
							10 5
	21	5·44	14·67	0·01	203·44	10 41	
							11 17
	23	5·47	14·60	0·02	185·96	11 53	
							12 28
	25	5·50	14·52	0·04	168·46	13 4	
							13 40
	27	5·54	14·42	0·06	150·93	14 16	
							14 52
	29	5·58	14·30	0·09	133·38	15 28	
							16 4
	31	5·63	14·17	0·12	115·81	16 41	
							17 17
Feb.	2	5·69	14·02	0·16	98·19	17 54	
							18 30
	4	5·76	13·86	0·20	80·52	19 6	
							19 42
	6	5·83	13·69	0·24	62·83	20 19	
							20 55
	8	5·91	13·50	0·28	45·09	21 32	
							22 8
	10	6·00	13·31	0·32	27·30	22 45	
							23 21
	12	6·09	13·11	0·36	9·46	23 58	
							...
	14	6·18	12·91	0·40	351·57	0 35	
							1 11
	16	6·28	12·70	0·44	333·63	1 48	
							2 25
	18	6·39	12·49	0·48	315·65	3 2	
							3 39
	20	6·50	12·27	0·52	297·61	4 16	
							4 53
	22	6·62	12·06	0·55	279·52	5 30	
							6 7
	24	6·74	11·85	0·58	261·40	6 44	
							7 21
	26	6·86	11·64	0·61	243·22	7 59	
							8 36
	28	6·98	11·43	0·64	225·00	9 14	
							9 51
Mar.	2	7·11	11·22	0·67	206·72	10 29	
							11 6
	4	7·24	11·02	0·69	188·40	11 44	
							12 21
	6	7·38	10·82	0·71	170·04	12 59	
							13 37
	8	7·52	10·62	0·73	151·64	14 15	
							14 53
	10	7·66	10·42	0·75	133·19	15 31	
							16 9
	12	7·80	10·23	0·76	114·71	16 47	
							17 25
	14	7·94	10·05	0·77	96·20	18 3	
							18 41
	16	8·08	9·87	0·78	77·65	19 19	
							19 57
	18	8·23	9·69	0·79	59·06	20 36	
							21 14
	20	8·38	9·52	0·80	40·44	21 52	
							22 31
	22	8·53	9·35	0·80	21·78	23 9	
							23 47
	24	8·68	9·19	0·81	3·10	...	
							0 26
	26	8·84	9·03	0·81	344·39	1 4	
							1 42
	28	8·99	8·88	0·81	325·65	2 21	
							2 59
	30	9·15	8·73	0·81	306·86	3 38	
							4 16
April	1	9·30	8·59	0·81	288·06	4 55	
							5 33
	3	9·46	8·45	0·81	269·23	6 12	

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Greenwich Noon.	P.	L−O.	B.	A−L.	*B.*	Q.	E.
1899.							
April 5	348°·81	210°·13	+12°·35	+36°·29	+23°·35	101°·63	36°·16
7	349·22	210·75	12·66	36·60	23·50	101·81	36·35
9	349·65	211·40	12·97	36·89	23·64	102·00	36·52
11	350·10	212·07	+13·28	+37·16	+23·77	102·21	36·67
13	350·56	212·77	13·60	37·40	23·90	102·43	36·80
15	351·03	213·48	13·92	37·63	24·02	102·65	36·91
17	351·52	214·21	14·24	37·85	24·13	102·88	37·00
19	352·02	214·96	14·57	38·06	24·24	103·11	37·07
21	352·53	215·74	+14·91	+38·25	+24·34	103·34	37·13
23	353·06	216·53	15·25	38·42	24·44	103·58	37·17
25	353·60	217·34	15·59	38·57	24·53	103·82	37·19
27	354·14	218·17	15·92	38·69	24·62	104·07	37·20
29	354·70	219·02	16·26	38·79	24·71	104·32	37·20
May 1	355·27	219·88	+16·60	+38·89	+24·79	104·57	37·18
3	355·84	220·76	16·94	38·97	24·86	104·82	37·15
5	356·42	221·65	17·28	39·05	24·92	105·08	37·11
7	357·02	222·56	17·62	39·10	24·98	105·34	37·06
9	357·62	223·49	17·95	39·14	25·03	105·60	37·00
11	358·22	224·43	+18·28	+39·17	+25·08	105·86	36·92
13	358·84	225·39	18·61	39·18	25·12	106·13	36·83
15	359·47	226·36	18·94	39·18	25·15	106·40	36·74
17	0·10	227·35	19·27	39·16	25·17	106·66	36·63
19	0·74	228·35	19·59	39·14	25·19	106·92	36·52
21	1·38	229·36	+19·90	+39·11	+25·20	107·17	36·39
23	2·03	230·39	20·21	39·06	25·21	107·42	36·26
25	2·69	231·43	20·52	38·99	25·21	107·67	36·12
27	3·35	232·49	20·82	38·91	25·21	107·92	35·98
29	4·02	233·56	21·12	38·82	25·20	108·17	35·83
31	4·69	234·64	+21·42	+38·71	+25·18	108·41	35·66
June 2	5·37	235·73	21·71	38·60	25·15	108·65	35·49
4	6·05	236·83	21·99	38·48	25·11	108·88	35·32
6	6·74	237·95	22·26	38·34	25·07	109·11	35·13
8	7·43	239·09	22·53	38·18	25·03	109·33	34·94
10	8·12	240·24	+22·79	+38·02	+24·98	109·54	34·75
12	8·81	241·40	23·04	37·84	24·92	109·75	34·55
14	9·51	242·57	23·28	37·66	24·86	109·95	34·34
16	10·22	243·76	23·52	37·45	24·79	110·15	34·13
18	10·92	244·95	+23·75	+37·24	+24·71	110·35	33·91

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Greenwich Noon.		Light Time.	Appar. Diam.	Defect of Illumination.	Central Meridian.	Passage of Zero Meridian.			
				q	ω_0				
1899.		m	"	"	°	h	m	h	m
								6	50
April	5	9·61	8·31	0·80	250·38	7	29		
								8	8
	7	9·76	8·18	0·80	231·51	8	47		
								9	26
	9	9·92	8·05	0·79	212·60	10	5		
								10	44
	11	10·07	7·92	0·79	193·68	11	23		
								12	2
	13	10·23	7·80	0·78	174·73	12	41		
								13	20
	15	10·38	7·68	0·78	155·77	13	59		
								14	38
	17	10·54	7·57	0·77	136·78	15	17		
								15	56
	19	10·70	7·46	0·76	117·78	16	35		
								17	14
	21	10·85	7·35	0·75	98·74	17	53		
								18	32
	23	11·01	7·25	0·74	79·70	19	11		
								19	50
	25	11·16	7·15	0·73	60·64	20	30		
								21	9
	27	11·32	7·05	0·72	41·55	21	48		
								22	27
	29	11·47	6·96	0·71	22·45	22	7		
								23	46
May	1	11·62	6·87	0·70	3·33	...			
								0	26
	3	11·78	6·78	0·69	344·20	1	5		
								1	44
	5	11·93	6·69	0·68	325·06	2	23		
								3	2
	7	12·08	6·61	0·67	305·89	3	42		
								4	21
	9	12·23	6·53	0·66	286·71	5	1		
								5	40
	11	12·38	6·45	0·65	267·52	6	20		
								6	59
	13	12·52	6·37	0·64	248·31	7	39		
								8	18
	15	12·67	6·30	0·63	229·09	8	58		
								9	37
	17	12·81	6·23	0·62	209·85	10	17		
								10	56
	19	12·96	6·16	0·60	190·60	11	36		
								12	16
	21	13·11	6·09	0·59	171·33	12	56		
								13	36
	23	13·25	6·02	0·58	152·05	14	15		
								14	55
	25	13·39	5·96	0·57	132·76	15	34		
								16	14
	27	13·53	5·90	0·56	113·46	16	53		
								17	33
	29	13·67	5·84	0·55	94·14	18	12		
								18	52
	31	13·81	5·78	0·54	74·81	19	31		
								20	11
June	2	13·95	5·72	0·53	55·47	20	51		
								21	31
	4	14·08	5·67	0·52	36·12	22	11		
								22	51
	6	14·21	5·62	0·51	16·75	23	31		
								...	
	8	14·35	5·56	0·50	357·36	0	11		
								0	51
	10	14·48	5·51	0·49	337·96	1	30		
								2	10
	12	14·61	5·46	0·48	318·55	2	50		
								3	30
	14	14·74	5·41	0·47	299·14	4	10		
								4	50
	16	14·87	5·36	0·46	279·70	5	30		
								6	10
	18	15·00	5·32	0·45	260·26	6	50		

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Greenwich Noon.	P.	L−O.	B.	Λ−L.	*B*.	Q.	E.
1899.	°	°	°	°	°	°	°
June 20	11·62	246·15	+23·96	+37·04	+24·63	110·54	33·69
22	12·33	247·36	24·17	36·81	24·54	110·72	33·46
24	13·04	248·59	24·38	36·57	24·44	110·90	33·23
26	13·75	249·82	24·57	36·32	24·33	111·07	33·00
28	14·46	251·07	24·75	36·06	24·22	111·23	32·76
30	15·17	252·32	+24·92	+35·79	+24·11	111·39	32·52
July 2	15·87	253·58	25·08	35·52	23·99	111·54	32·27
4	16·57	254·85	25·23	35·23	23·86	111·69	32·02
6	17·27	256·13	25·37	34·94	23·72	111·83	31·76
8	17·97	257·42	25·49	34·64	23·58	111·96	31·50
10	18·67	258·72	+25·60	+34·33	+23·43	112·08	31·24
12	19·37	260·04	25·71	34·00	23·28	112·19	30·98
14	20·07	261·37	25·81	33·66	23·12	112·29	30·71
16	20·76	262·70	+25·90	+33·32	+22·95	112·38	30·44

The constants are the same as those employed in the first portion of the ephemeris.

L−O+180°, Λ−O+180° are the longitudes of the Earth and Sun referred to the plane of *Mars'* equator and reckoned from O, the point of the vernal equinox of *Mars'* northern hemisphere; thus Λ−L is the angle between the meridians of *Mars* which are central to the Earth and to the Sun; B, *B* are the latitudes of the Earth and Sun reckoned from the plane of *Mars'*

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Greenwich Noon.	Light Time.	Appar. Diam.	Defect of Illumination.	Central Meridian.	Passage of Zero Meridian.	
			q	ω_0		
1899.	m	"	"	°	h m	h m
						7 30
June 20	15·12	5·28	0·44	240·82	8 10	
						8 50
22	15·24	5·24	0·43	221·36	9 30	
						10 10
24	15·36	5·20	0·42	201·89	10 51	
						11 31
26	15·48	5·16	0·42	182·41	12 11	
						12 51
28	15·60	5·12	0·41	162·92	13 31	
						14 11
30	15·72	5·08	0·40	143·42	14 51	
						15 31
July 2	15·84	5·04	0·39	123·92	16 11	
						16 51
4	15·95	5·00	0·38	104·40	17 31	
						18 11
6	16·06	4·97	0·37	84·88	18 51	
						19 31
8	16·17	4·93	0·37	65·35	20 11	
						20 51
10	16·28	4·90	0·36	45·81	21 32	
						22 12
12	16·39	4·87	0·35	26·24	22 52	
						23 32
14	16·50	4·84	0·34	6·67	...	
						0 13
16	16·60	4·81	0·33	347·10	0 53	
						1 34

equator, Q the position angle of the greatest defect of illumination, q the amount of the greatest defect of illumination, E the areocentric angle between the Earth and Sun.

The spring equinox of Mars' northern hemisphere occurs 1898 November $6^{d}\cdot 3$, and the summer solstice 1899 May $24^{d}\cdot 2$.

Benvenue, Ulundi Road, Blackheath, S.E.:
1898 *September* 28.